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PROCEEDINGS

OF THE

AMERICAN SOCIETY OF MICROSCOPISTS

MINUTES OF THE TENTH ANNUAL MEETING.

The Tenth Annual Meeting was held in Pittsburgh, Penn., August 30–31, September 1 and 2, 1887.

The Society was called to order at 10 A. M. August 30, by the President, William A. Rogers, in the Chapel of the First Presbyterian Church. The President spoke as follows:

"The American Society of Microscopists convenes in the City of Pittsburgh, upon the invitation of the Iron City Microscopical Society, under auspices which give promise of a most successful meeting. Already the evidences are seen on every hand The provision which has been made for the successful prosecution of our work, the cordial greeting upon the arrival of every incoming train, the enterprise shown by our faithful ally, the Press, — all these things convince us that we have been fortunate, indeed, in the selection of Pittsburgh as our place of meeting.

"It will give us pleasure to listen to the more formal expression of the welcome which has been extended to us, not merely because we appreciate good fellowship, but because we desire to make a permanent record of this expression in our Annual Proceedings. The members of this Society hardly need an introduction to the President of the Iron City Microscopical Society, a society which has given us such a splendid example of vigorous activity. We shall be glad to hear from Mr. Mellor."

Remarks were then made by Mr. Charles C. Mellor, President of the Iron City Microscopical Society. He spoke appropriately as follows:

"It is but five years since a few of us met and organized the Iron City Microscopical Society, and I think I can safely say that none of us then supposed that it would in their time attain its present size and importance; and I am quite sure that not a single one of us even dreamed that we would have the courage, or receive sufficient encouragement from our citizens, to justify us in inviting the American Society of Microscopists to hold its Tenth Annual Meeting in our city. But these things have both come to pass,—our local society has attained such a size and importance that it does not need a microscope to discover it, and we hope it is now one of the permanent institutions of our city, and the American Society of Microscopists is here.

"This is a proud day for our local society, and I feel confident that your presence here — the sight of so many persons interested in the beautiful and useful science of Microscopy — will stimulate all our members to greater efforts to place our society on a firmer footing and to do better work and more of it.

"To the citizens of Pittsburgh, who have so kindly helped us with encouraging words and also substantial assistance, I desire in the name of the Iron City Microscopical Society to tender our warmest thanks, and also to the Press for notices published. The address of welcome will now be given by the Chairman of the Reception Committee. I have the honor to introduce to you Dr. B. C. Jillson."

The address:

"*Mr. President and Members of the American Society of Microscopists:*

"You have honored Pittsburgh by selecting it as the place of your annual meeting. We appreciate the honor. We most cordially welcome you to our city. We will do all we can to make your stay profitable and pleasant.

"Pittsburgh is known far and wide for its energy and industry, especially in the line of metallurgy and manufactures. Like other large and busy cities, there are few here who are specially interested in that particular branch of science to which you are devoted. A few years ago less than half a dozen persons owning microscopes occasionally met in an informal manner for study and consultation. That number has increased more than ten-fold, and is now a regular organization with rooms for study and work. We are young. We have as yet done but little. We hope to do more in the future, and we feel sure that your presence here will encourage and stimulate us to greater exertions. There is a goodly number of persons here who appreciate abstract science, and are willing to spend both time and money for its advancement. On yonder hill are two institutions which have carried the names of Pittsburgh and Allegheny to every part of the scientific world. The Allegheny Astronomical Observatory, by the genius of its principal observer, has, as you well know, added much to the world's knowledge of the physics of the sun, the character of our atmosphere, and the invisible part of the solar spectrum; while in the other building, in a way peculiarly his own, the gifted director is able to grind lenses, polish prisms, rule spectroscopic gratings, and make other instruments of precision, which are said by scientific experts to be unequaled. This much has smoky, busy Pittsburgh done for abstract science; a contribution of which we are by no means ashamed.

"Your Society has an enviable reputation for industry. We know that you came here to work and that your time is limited. We are also well aware that man cannot live by the microscope alone, and that most of you are engaged in some other business, profession or pursuit. In a city so large as ours with so many and varied points of interest, it would be surprising if there was not something in the particular line of each well worth your attention. If you are a metallurgist, our numerous furnaces are open to you. If physics or mechanics is your specialty, there is much to be seen in our many and varied forms of manufactures. Should you desire to investigate the applicature of electricity in new and varied forms, we can show it you. Here chemistry has many applications in the arts. Some of our bridges embrace appliances so unique that students from Ann Arbor and Hoboken have considered them worthy a visit. Our Geology has some features of interest. Directly across the river from your headquarters a section of coal is well exposed, showing at a glance the peculiarities of the Pittsburgh coal seam, which extends over an area of 20,000 square miles, and has been made the base line of Carboniferous Geology. There are, right here in our city, extensive river terraces of the Champlain era, two hundred feet above the present river beds. Thirty years ago oil was discovered in the rocks of Western Pennsylvania, and our city became the head-centre for oil refiners, the invention and manufacture of drilling tools, oil tanks, etc. It is hardly three years since one of our enterprising citizens, living in the very heart of the city, prompted by the laudable desire to know what was in the rocks beneath him, erected a derrick in his yard. He struck — not oil, but gas, and a new era dawned on our city. Pittsburgh has been called 'the smokiest city on the face of the earth.' It is fast becoming the clearest and cleanest city in the Union. In this valley, containing more than three hundred thousand people, natural gas is universally used for heating and domestic purposes; while its application to our manufactures has in every case improved, and in many completely revolutionized, these branches of industry. This vicinity, as you well know, is rich in historical associations. The land on which our city stands passed from the Indians to the French, from the French to the English, and from the English to our own government. At 'The Point,' where the Allegheny and Monongahela unite to form the Ohio, Fort Duquesne and afterwards Fort Pitt were erected. Both these forts have now disappeared, but a block house, once a part of Fort Pitt, still remains, an object of interest to visitors. On the hill where our court house now stands General Grant and his Highlanders were massacred while on their way to Fort Duquesne. Ten miles to the east of us is the battlefield where Braddock was defeated. We have planned an excursion for to-morrow to some large steel works built on this historic spot. But I have said enough by way of introduction to an invitation I am about to give. If any of you wish to visit any points of interest in or about our city, if you will make known your desire to any member of the Reception Committee we will take great pleasure in furnishing you with a passport and guide to the locality.

"In behalf of the City of Pittsburgh in general and the Iron City Microscopical Society in particular, it is my pleasant duty to again cordially welcome you to our city, and to express the hope that your session may be both profitable and interesting."

The President replied in these words:

"I am sure that I express the sentiments of every member of this Society in thanking you most heartily, as the representative of the Iron City Microscopical Society, for the cordial welcome extended to us. The local committees of your Society have done their work faithfully and well. It remains for us to justify this expenditure of time and money, this careful preparation, this thoughtful attention, by a session which shall mark an era in our history.

"I suspect that few members of this Society realize the amount of what is sometimes called 'dead work' which needs to be done when a local society undertakes to see that nothing shall be left undone to make a meeting of this character an unqualified success. 'Dead work' in science is that careful, previous preparation which attracts no attention, but which, nevertheless, must precede every brilliant discovery; it is the arming, the equipping and the drilling of an army in preparation for one short hour of battle. The citizens of a large city, especially of a city which has such a varied range of industries as the City of Pittsburgh, have many interests in common with us. We ought to be mutually helpful to each other. There is hardly a problem connected with the practical industries of this city in which the microscope may not be made a useful auxiliary. I am not now speaking of technical scientific investigations, but rather of the aid which it may give in the practice of the useful economies of daily life. If the agricultural chemist can make ten spears of grass grow where only one grew before, he who uses the microscope as a means to an end ought to be able to find many ways, not only of adding to the knowledge and the happiness of the world, but of increasing its commercial prosperity as well; for I hold that it is not an unworthy object to show how one dollar may be made to do the work of ten.

"The claims of the microscope as a useful ally in almost every pursuit in life are coming to be more generally recognized, and this Society has a well-defined obligation to extend the field of its applications. While the American Society of Microscopists must ultimately stand or fall according to the scientific character of its published proceedings, and while we must set a high ideal before us in this respect, it has other and equally well defined obligations to which we ought to give due attention. Pure science is a necessity in this world, but it is not the only thing worth living for. To add to the sum of useful happiness of mankind is a worthy object. I suspect that a community composed entirely of technical specialists in science would not prove to be an ideal one in every respect. In fact, if such a community should be able to struggle through the first stages of a doubtful existence, I doubt if its attractions would be such as to secure a large accession to its numbers. We live in a busy world of activities, in which every interest ought to contribute something to every other interest.

" Since one of the chief objects of your Society is the critical study of the useful problems of life, we ought to extend a hearty welcome to every honest worker. I appeal especially to young men to enter our ranks; to young men who are just entering upon professional life; to young men who have just completed their college course; to young men who are still in college; to lovers of nature everywhere who are sincere worshippers at her shrine. As far as I have any influence it shall be given in favor of aid and encouragement to every sincere effort to seek the truth. The mere theorist has no place among us. The scientific crank we abominate and will not tolerate. The honest student of nature shall always find a home among us and a hearty welcome at all times.

" Members of the American Society of Microscopists, I congratulate you on the prospect of a successful meeting. We are now ready to enter upon the work before us."

Prayer was then offered by Rev. John Fox.

The Secretary then reported for action the recommendations of the Executive Committee.

1. That By-law seven which reads as follows be rescinded: "The Executive Committee shall not act upon a recommendation to membership until the iniation fee, $3.00, and one year's dues, $2.00, shall have been received by the Treasurer."

On motion the recommendation was adopted.

2. The following were then elected members of the Society: William W. Wishard, Indianapolis, Ind.; Herbert M. Hill, Watertown, N. Y.; George M. Sternberg, Baltimore, Md.; Freda Detmers, Columbus, O.; Morgan W. Ayres, Upper Mont Clair, N. J.; William C. Gardner, Mont Clair, N. J.; Arthur R. Warren, North Madison, O.; Mark Francis, Glendower, O.; Charles W. Brown, New York City; Robert Robotham, Syracuse, N. Y.; George S. Allen, Mont Clair, N. J.; Geo. W. Rafter, Tuscaloosa, Ala.; Veranus Alva Moore, Washington, D. C.; Ira W. Lewis, Dixson, Ill.; J. D. Griffith, Kansas City, Mo.; James Eichberg, Cincinnati, O.; Henry Dickson Bruns, New Orleans, La.; P. H. Dudley, New York City.; William H. Sheib, Wheeling, W. Va.; L. D. Wilson, Wheeling, W. Va.; F. W. Entrikin, Findlay, O.; Henry B. Ward, Troy, N. Y.; Lewis M. Early, Columbus, O.; A. J. Hoenny, St. Louis, Mo.; Hiram De Puy, Pittsburgh, Pa.; C. G. Jennings, Detroit, Mich.; B. C. Jillson, Pittsburgh, Pa., and J. M. Stedman, Ithaca, N. Y.

3. That the following be made a By-law of the Society: All motions or resolutions relating to the business of the Society shall be referred for consideration to the Executive Committee before discussion and final action by the Society.

After discussion the rule was adopted by a unanimous vote.

4. Special attention was called to the Spencer-Tolles Memorial Fund, and the hope expressed that it may be materially increased during the present meeting. The President urged the increase of the fund so that the annual income shall be a sum large enough to make it worth while to appropriate it for the purpose of encouraging original research, especially by our young men.

Notice of deceased members was then read by the Secretary. Five members have died during the year: Myron

C. Davis, Bernard Persh, Allen Y. Moore and Chas. Blasdale. [For Necrology, see page 329].

C. M. Vorce then read a carefully prepared Memoir of Dr. Allen Y. Moore. [See page 329].

R. H. Ward described an erecting apparatus designed especially for use with the binocular microscope.

Dr. R. H. Ward exhibited an erecting arrangement especially intended for use with the Wenham binocular, but also available for a monocular not adapted to receive an erecting objective in the draw-tube. The apparatus, combined with any convenient camera lucida, has also proved useful as an " embryograph " for drawing or measuring large objects at any desired amplification, from natural size (or even less) up to 20 or 30 diameters or more, as in making or copying diagrams, etc. For the lowest powers it may be combined with an ordinary tank microscope, or even with a compound body supported on a bull's-eye pillar, or on a chemical retort stand, by means of its various sliding rings.

For the objective a compact form, as a " solid triplet," is used, a 2-inch, giving a suitable range of powers and good optical effect, but a 1-inch, taking less room, and being therefore preferable for small stands. This lens is mounted at the top instead of the bottom of its brass tube, so as to stand close below the binocular prism, while the bottom of its tube has an inside society-screw for carrying in the usual position, only a little lower, another objective which serves as an erector. The lower lens acts like a telescope objective or an achromatic condenser, forming in the focal plane of the upper a reduced and inverted image of the object at its own distant, and in this case, lower, conjugate focus, which image the upper lens, the acting objective, magnifies and erects. The adapter connecting the two has an adjustment for length, by screw or slip-tube; and the lenses are worked at their adjacent sides at so near their principal focal distances that a half-inch change of distance, together with two or three inches change of draw-tube, gives a range of powers of from 5 to 50 diameters, or a lower range by a different selection of lenses, with an inversely corresponding width of field.

The illumination for the lowest powers is easy for opaque objects, but for transparent effects it may require some form of white-cloud contrivance, of which a white card laid upon the mirror, with its corners turned down to hold it in position, and intensely lighted, is always available and often efficient. The definition is, of course, somewhat impaired, — few persons would expect to improve it by an erector of any sort — but is sufficiently good for dissecting minute objects, picking out fibres, diatoms, etc., or drawing diagrams. The increased focussing distance of this arrangement prevents its adaptation to very small stands, and brings the ocular to a somewhat higher level than usual. This increased height, which is of real advantage in drawing diagrams or large plates, is not inconvenient when the microscope is in an inclined position, but requires one to stand, or use a low table or high stool, when it is erect. As the two-thirds objective is also an excellent lens for general use, the only special cost of the arrangement is that of the adapter and the inexpensive 1 or 2 in. lens.

Discussed by W. H. Seaman, Edward Pennock, and George E. Fell.

Mr. John A. Brashear extended an invitation to the Society to visit the Optical Works of Brashear & Co., and the Allegheny Observatory. The invitation was accepted and the thanks of the Society tendered for the courtesy.

Mr. C. C. Mellor announced that there would be excursions to places of interest after the adjournment of the afternoon session and that members of the committee on reception would escort the several parties.

Adjourned to meet at 2 P. M.

TUESDAY, August 30, 1887.

Society called to order at 2 P. M., President Rogers in the chair.

On proper recommendation, the following were elected members: William J. Prentice, Allegheny City, Pa.; J. H. McRoberts, Pittsburgh, Pa.; A. G. Kornblum, Pittsburgh, Pa.; William H. Keck, Allegheny City, Pa.; W. A. E. Drescher, New York City.

Papers were then read as follows:

1. The Length in millimeters, and the Parts included in Microscopical Tube-length by the various Opticians of the World; also the Thickness of Cover-glass for which Unadjustable Objectives are corrected.—Simon H. Gage.

Discussed by W. H. Seaman, Carl F. Lomb and H. H. Turner.

2. Some Experiences in Crystallization by Cold.—Frank L. James.

In discussing this paper, W. H. Seaman said: " My experience in the line of work described by Dr. James shows its uncertain results. Out of four lots of Ethyl Gallate slides, only one was first class, some of which are in the hands of members here present. Temperature effects chemical action, as in the case of sodium chloride and zinc sulphate, that at a temperature of between 35°—45° F. undergo reciprocal change, but at higher temperatures the action reverses. The conditions effecting crystallization are principally the temperature and dryness of the air, and the density of the solution. Crystallization is the arrangement of the molecules of a substance along the lines of polar forces, which act slowly, hence, evaporation must be slow to admit of the solvent fluid remaining a sufficient time to secure the necessary mobility of the molecules. Sometimes too rapid evaporation may be prevented by adding a little gum water, first suggested by one of our number. Only by this means have I succeeded with quinate of quinine which otherwise dries up on the edges of the drop to an amorphous mass. Too strong a solution or too great a quantity in one place has a similar effect by forming an opaque body."

3. Additional Notes on Certain Rotatoria.—David S. Kellicott.

Discussed by S. H. Gage.

4. Some New and Rare Infusoria.—David S. Kellicott.

Read by title.

5. Apochromatic Objectives.—Ernst Gundlach.

The paper was read by Henry H. Turner

6. *Observations on the Effects of Powerful Electric Currents on the Tissues of Animals.*—George E. Fell.

Discussed by S. H. Gage, W. J. Lewis, L. D. McIntosh and W. P. Manton.

Under the order informal announcements of new apparatus and methods, Dr. James E. Reeves explained his method of preparing and mounting sections of various animal tissues. Remarks on his methods were made by S. H. Gage, W. H. Seaman, W. P. Manton and others.

Adjourned to meet at 8 o'clock to listen to the President's annual address.

[After the close of the afternoon session, parties visited places of interest. Notably, a large party visited the Allegheny Observatory and the Optical Laboratory of John A. Brashear].

EVENING, August 30, 1887.

In the evening the President read the annual address to an appreciative audience, composed of members of the Society and citizens. Mr. C. C. Mellor presided and in introducing the President said: "In accordance with the custom of American Society of Microscopists, we are assembled this evening to listen to the annual address of its President. The name and the work of him whom it is the honor of the Society to have this year as its chief executive officer, are too well known to need any words or comment from me. for wherever microscopy or micrometry is known the name of William A. Rogers is equally well known. I have the honor of introducing to you Prof. William A. Rogers."

The address was a profound discussion of an important question in physics, entitled, "The Microscope as a Factor in a study of the Behavior of Metals under Variations of Temperature."

WEDNESDAY, A. M., August 31, 1887.

President Rogers in the chair.

Action on recommendations of the Executive Committee:

1. Election of the following members: William James, Columbus, O.; Susanna S. Phelps Gage, Ithaca, N. Y.; Frank Vandepoel, Newark, N. J.; W. J. Riggs, Allegheny City, Pa.; E. A. Mundorff, Pittsburgh, Pa.; Frederick Gærtner, Pittsburgh, Pa.; Frederic N. Pease, Altoona, Pa.; Carl H. Van Klein, Dayton, O.

2. On the suggestion of a member, the Committee recommended that the election of the nominating committee, which usually occurs on the morning of the day before final adjournment, should this year take place at the close of this, Wednesday A. M. session. On motion the election of said committee was made the order at 12 o'clock.

3 The invitation of the Westinghouse Electrical Co., to visit their works was accepted and the thanks of the Society to the officers for the courtesy. The time for the visit was fixed at 4:30 P. M. Thursday.

Dr. H. Dickson Bruns offered the following, which under the rules was referred to the Executive Committee.

"*Resolved:* That hereafter the Society adopt as a rule of proceeding the admirable suggestion of Dr. James E. Reeves, that each afternoon session of the annual meeting be devoted to practical work in the preparation and display of microscopical objects."

PAPERS AND DISCUSSIONS.

1. *Cements and Waxes.*— W. H. Seaman.

Professor Wm. H. Seaman said the matter he desired to present was a kind of summary of interesting results of the meetings of the Washington Microscopical Society.

Early last winter Dr. Thomas Taylor suggested that a varnish known as Berry's Hard Finish, might serve as a cement. This varnish is in very extensive use for coating wood in its natural colors, and hence easily obtained everywhere. Dr. C. T. Caldwell, upon trial, found the material not only useful as a cement, but also as a mounting substance proper. Since, a number of the members have used it with the most favorable results. Slides were shown in which insects had cleared up well without any previous preparation. If too thick the material may be thinned with turpentine. One of its advantages is that it does not precipitate when brought in contact with aqueous solutions to anything like the extent that balsam does.

Professor Seaman also described a new imbedding material for section cutting. He said: Dr. J. H. Blackburn, of the Government Insane Asylum, in attempting to carry out the Reeves, process of mounting failed entirely to get satisfactory results with what was sold to him by the local druggist as myrtal wax, which he desired to try at the suggestion of Dr. Miller. On returning the wax and stating there must be some other substance called myrtal wax, he received an article that gave perfect satisfaction, so much so, indeed, that he found it better than paraffin, and substituted it for that. Upon testing, the speaker found it was the Japan wax obtained from *Rhus succedanea*, now an extensive article of commerce. The substance is peculiar in its wide range between its fusing and solidifying points. It solidifies without wrinkles and sticks close to an imbedded object — qualities that render it especially valuable to the section cutter. It is not strictly a wax at all, but a fat, since it consists chiefly of palmitic acid, and is capable of saponification. Dr. Blackburn had shown whole brains saturated with it so perfectly, and preserved so naturally except color, that there seemed to be no reason they could not be employed as models for class demonstration. To all appearances they are permanent. The substance may be obtained from wholesale druggists.

R. N. Reynolds, of Detroit, remarked that Berry's Hard Finish is substantially Zanzibar copal dissolved in turpentine.

DISCUSSION.—Dr. Jas. E. Reeves inquired at what temperature waxes melted.

Prof. Seaman replied that they liquify from 53° to 55° C., solidifying again at 40° C.

R. N. Reynolds recommended the use of "Berry Brothers' Finish." He said it is a gum obtained from Zanzibar ; he saws a slice and grinds it to any desired thinness ; benzol does not dissolve it ; he possesses old mounts prepared with this material and considers them durable.

Dr. J. E. Reeves remarked that any wax with a melting point above 140° F. is useless for imbedding ; a brief exposure to such a temperature would destroy the tissue ; on cutting this wax Meynert finds it too brittle. He said he had had great trouble in getting proper wax and considered paraffin the best material to be had at present.

Prof. Seaman replied that he thought Japan wax would prove to be useful as its melting point was 120. F. and thus below what Dr. Reeves considers safe.

Dr. F. L. James said he had studied all cements in use and regarded white zinc, as prepared by a formula of his already published, as nearly perfect wherever a cell is required.

His attention had been called, by Dr. Taylor, to the "hard finish" already mentioned ; its translucency can be cleared by pure benzol ; pure benzol will crystallize at the freezing point, the sort used by him was marked "crystalizer."

2. *Method of Estimating the Number of Trichinæ in Meat.*—Simon H. Gage.

DISCUSSION: Edward Pennock asked if this method would not be erroneous inasmuch as the Trichinæ would be cut in two and thus doubly counted?

Dr. F. W. Entrikin inquired by what means the young Trichinæ were distributed.

Prof. Gage said the young were bred in the intestines, bore their way into the blood vessels, and are thus carried to their destination.

Dr. Entrikin said Dr. W. B. Rezeur had made many experiments to determine this fact and had concluded that the ova alone were thus carried along.

3. *Disease Germs—Another Illustratiom of the Fact that Bacteria cause Disease.*—Thomas J. Burrill.

Discussion postponed owing to lack of time.

4 *Ending and Relation of the Muscular Fibers in the Muscles of Minute Animals.*—Susanna S. Phelps Gage.

The President then announced that the hour had come for electing the Nominating Committee and called for free nominations for the committee. Nine members were nominated. Simon H. Gage and John J. B. Hatfield were appointed tellers and the ballot ordered.

The Tellers reported the seven receiving the highest number of votes as follows: William J. Lewis, S. M. Mosgrove, George E, Fell, C. C. Mellor, George H. Clapp, Frank L. James and W. P. Manton.

The chair declared these gentlemen the Nominating Committee, to report a full list of nominations for officers Friday morning.

Adjourned.

WEDNESDAY, P. M. AND EVENING.

The Society as guests of the Iron City Microscopal Society, assembed at 2 P. M. on board the steamboat Mayflower, for an excursion twelve miles up the Monongahela to Braddock, the historical Braddock's Field. The beautiful scenery of this part of the Monongahela, the perfect air and sky, the very pleasant social reunion of the hour and the extreme thoughtfulness of the local Society, rendered the trip most enjoyable; especially so was the "working session" announced by President Mellor soon after the boat left the dock on the return. The hungry company showed unmistakable signs of appreciation.

The Mayflower landed the party at the dock of the Edgar Thompson Steel Works, thence they were conveyed by train to the works themselves, where all witnessed with delight the various processes in the manufacture of iron, the conversion of Bessemer steel, the rolling of steel rails, etc. The attendants of Phipps, Carnegie & Co., took great pains to explain the various operations and thus won the deserved hearty thanks of the Society.

In the evening there was a reception in the parlors of the Monongahela House. The social reunion was continued until a late hour.

THURSDAY, September 1, A. M. Session.

President Rogers in the chair.

The following were elected members: Frederick A. Holton, Kansas City, Mo., T. W. Johnson, Danville, Ind.

On recommendation of the Executive Committee it was decided to hereafter deliver the proceedings at the expense of the members, *i. e.*, by special arrangements by express.

The Executive Committee recommended the following substitute for the resolution regarding working session by Dr. Bruns. [page 346]: That the Executive Committee be requested to secure if possible for each half day's session of the Society, at its next annual meeting, one paper upon some subject of microscopical technique with accompanying demonstrations. This is not to interfere in any way with the regular working session.

The whole matter was, by resolution, referred again to the Committee by the Society.

Regarding the matter of tube-length [See p. 168] the following was recommended and adopted: Whereas the question of tube-length entered as a prominent and important factor into the consideration of the subject of nomenclature and powers and was repeatedly discussed at length both in Committee and by the Society; and, whereas, the Society at the Rochester meeting deliberately and unanimously committed itself to a policy in regard to the item of tube-length, it therefore seems too early to formally re-open the subject; and it is recommeded that it lie over for the present.

The Committee recommended the following disposal of the Spencer-Tolles Fund: The income of the Spencer-

Tolles Fund — the principal forever remaining intact — shall be applied to the establishment of a Fellowship for the encouragement of special research, and be held under the yearly appointment of the Society. The recipient of this Fellowship must be a member of the Society and must give evidence of special fitness for the appointment. The results of the research undertaken shall be communicated to the Society at the termination of his appointment. Adopted.

Subscriptions to the fund were then taken as follows: H. R. Spencer & Co. $25.00, W. A. Roger's $25.00, Iron City Microscopical Society, $25.00, S. H. Gage, $10.00 *The Microscope* $10.00. H. D. Kendall, $10.00, W. P. Manton, $10.00, T. J. Burrill $5.00, C. G. Milnor, $5.00.

The discussion of papers was then entered upon.

1. Foot Rot in Sheep.— Mark Francis.

The author being absent, Dr. H. J. Detmers read the paper.

2. Exhibition and Description of a Microscope made about 1738.—C. C. Mellor and Jacob Henrici.

3. Some Easy Methods of Testing Photographic Lenses.— H. H. Turner.

4. The Comparative Size of Blood Corpuscles of Man and Domestic Animals, with twelve photomicrographs of blood.— Freda Detmers, In the absence of the author, Dr. J. H. Detmers read the paper.

In discussing it Mr. Vorce said, "The better way in measuring blood corpuscles, is to test as large a number as possible, rather than to measure the largest and smallest, as no two series agree.

5. On a Microscopical Slide Catalogue.—R. H. Ward.

Dr. Ward presented a copy of this record to the Society.

6, The Tape Worm—Methods of preparation for Museum and the Microscope.—J. M. Stedman. Read by Mr. E. H. Sargent. Mounted specimens of much beauty were presented in illustrating the paper.

Prof. S. H. Gage remarked that on looking up methods of preparing these forms, he found only the one by drying the segments of the worm on paper. He wished to compliment Mr. Stedman on his success in preparing these elegant specimens.

7. A Description of Ergasilus Chautauquaensis, and a list of other Entomostraca found at Chautauqua Lake, in August 1886.—Charles S. Fellows.

The paper was read by Dr. Lester Curtis, and illustrated by a series of well mounted specimens.

8. Are Lupus and Tuberculosis Identical.—James E. Reeves.

Read by title at the request of the author.

9. Note on a New Rotiferon, Gomphogaster areolatus.—Charles M. Vorce.

Mr. W. H. Seaman moved that an engraving be made of the old microscope exhibited by Mr. C. C. Mellor for the Proceedings. Referred by rules to the Executive Committee.

Dr. W. P. Manton exhibited a mounting box and a camera.

Mr. Edward Pennock exhibited a simple form of centering substage. The centering is accomplished by means of two eccentrics working at right angles to each other.

Adjourned.

THURSDAY P. M. September 1, 1887.

Working session.

The whole of Thursday P. M. was devoted to practical methods of work. The several small rooms of the chapel as well as the main room, were occupied by tables for the convenience of the demonstrators. The committee in charge of this feature consisted of Jacob D. Cox, Thomas J. Burrill and D. S. Kellicott.

(*a*) The application of the Solar Microscope.

(*b*) Illumination of the Microscope with Electric Light, using Gundlach's Apochromatic Objectives. By L. D. McIntosh.

1. Demonstration of the method of preparing Casts, cutting Sections and mounting them. By James E. Reeves, assisted by Mary A. Spink.

2. (*a*) Cutting Sections by the "dry" method.

(*b*) Cutting Sections of injected specimens by the "wet" method, and mounting them in Canada balsam. By R. N. Reynolds.

(*a*) Section Cutting with Laboratory Microtome of Bausch & Lomb Optical Co.

b) Use of New Freezing Attachment to the above Microtome. By W. A. E. Drescher.

(*a*) Cutting, staining and mounting Vegetable Sections.

(*b*) Permanently marking slides. By J. J. B. Hatfield.

An arrangement for erecting the image with Binocular Microscopes. By R. H. Ward.

General Mounting. By Frank F. Colwell.

Methods of detecting adulteration in food materials. By C. M. Vorce.

Demonstration of a method for preparing Areolar Tissue. By Simon H. Gage, assisted by E. H. Sargent.

Mounting Living Objects in Life-slides. By Jos. H. Logan.

Methods of producing the crystalization of Chemicals. By W. H. Seaman.

Demonstration of the methods of embryological research ; Incubation ; opening of the egg ; hardening ; staining *in toto;* imbedding ; section cutting in the Thoma Microtome ; mounting. By W. P. Manton and C. G. Jennings.

The apparatus used in this demomstration is from the Microscope Laboratory.

Cutting, grinding and mounting Favosites Hamiltonia, Eozoon Canadense and Alicolites Davidsonia. By Chas. Wellington and Mrs. Wellington.

Sharpening section and other knives. A simple and cheap method of engraving. Mounting in glycerin. By F. L. James.

Methods of collar correction for immersion objectives. Use of Prof. H. L. Smith's Apertometer in measurement of balsam angle of objectives. (Visitors are invited to bring immersion objectives for measurement). By H. R. Spencer and E. K. Buttles.

Preparing Sponges. By Henry Mills.

FRIDAY A. M., September 2, 1887.

The session was called to order by the President.

Recommendations of the Executive Committee were first considered.

1. The following nominated and elected members of the Society : Dr. Augustine Rue Booth, Shreveport, La.; Dr. C. Q. Jackson, Pittsburgh, Pa.; Placide Reynes, New Orleans, La.; Wm. Shannon, Beaver Falls, Pa.; Mrs. J. C. Eddy, Cleveland, O.; Jas. H. Porte, Pittsburgh, Pa.; Edwin T. Painter, Pittsburgh, Pa.

2. The resolution relating to working session [see p. 351] was re-reported with the recommendation that it pass. On motion it was adopted.

3. By vote the proposition to give two bound sets of the Proceedings to the libraries of Pittsburgh was adopted. The Iron City Microscopical Society was asked to receive them and place them as they desired.

The report of the Committee on Nominations of Officers was then presented :

President	Prof. D. S. Kellicott, Buffalo, N. Y.
Vice-Presidents	Prof. T. B. Stowell, Cortland, N. Y.
	Prof. H. J. Detmers, Columbus, O.
Secretary	Prof. T. J. Burrill, Champaign, Ill.
Treasurer	Dr. S. M. Mosgrove, Urbana, O.
Executive Committee	C. C. Mellor, Pittsburgh, Pa.
	Dr. H. D. Kendall, Grand Rapids, Mich.
	Dr. R. J. Nunn, Savannah, Ga.

By vote Mr. C M. Vorce was directed to cast the ballot of the Society for the officers nominated. After the vote was cast the President declared the gentlemen named officers elect of the Society.

The reading of papers was resumed.

1. *The Fallacies of Bacteriological Research.*—George W. Lewis.

The author was absent and Dr. George E. Fell read the paper.

Dr. Fell, in discussing the paper, said he could not well dispense with the microscope in diagnosing Tuberculosis, for example, he gave an instance : Three cases were examined, the sputa of number one was found to contain Bacilli, in the other two he found none. The man from whom the first was derived has since died of phthisic ; the other two are living.

Dr. Detmers said the method by culture was too slow ; the patient might be under ground before the culture shows results. He quoted a case in which Koch had failed in 1865, owing to want of homogeneous objectives ; we are much indebted to our opticians for our knowledge of bacteria.

Prof. Burrill related an instance where Prof. S. A. Forbes had been cultivating insect destroying bacteria, until thoroughly familiar with their appearance, yet in some tubes, considered characteristic, saved for some time, on microscopical examination, showed a different organism. He believed in the microscope. Dr. Detmers had known similar cases.

Dr. R. J. Nunn urged the importance of immediate microscopical examination.

Dr. R. H. Ward, chairman, presented the report of the committee appointed last year on the Fasoldt plate.

The President said he had been a most interested listener and if Mr. Fasoldt had ruled the lines he should receive the credit he deserves, but the lines must be counted. He, continuing, said he could rule lines so close together that there would be no space between them; as Mr. Fasoldt's plates are ruled with the alternate lines longer they could be counted and photographed. Nobert submitted to this test triumphantly and Mr. Fasoldt must do the same, but he gave the committee notice that he should attack the report most vigorously. He wished to say again that Mr. Fasoldt deserves great credit for his rulings.

Dr. Detmers said he would attempt to photograph the lines; for if he could count them he could photograph them.

2. The Life History of the Diatomaceæ, Part II.—Hamilton L. Smith.

Read by title.

3. A New Photo-micrographic Camera.—George W. Rafter.

Read by title.

4. History of my use of the Microscope.—Ephriam Cutter.

Read by title.

5. *The Cardiac Muscle Cells of Man and certain other Mammals.*—Boardman L. Oviatt.

The paper was read by Prof. Gage.

Dr. Fell and Prof. Seaman complimented the work shown in this paper.

President Rogers said he felt like complimenting Cornell University on the work shown at last year's meeting as well as this.

6. *Zeiss' Apochromatic Objectives.*—H. J. Detmers.

Prof. Gage said he had obtained three months ago a microscope and three objectives from Zeiss; he had tested them on histological work, but thought them no better than others in his possession, still they are most excellent in giving clear definition and ease to the eyes.

Dr. Fell said that this was of importance and Zeiss should have the credit for it. An objective should be thoroughly tested before judgment was rendered.

Mr. H. H. Turner thought that the superiority of the latest objectives was in the absence of color.

Prof. T. J. Burrill presented for a special committee the following, which were unanimously adopted:

Resolved, That the heartiest thanks of this Society are eminently due, and are hereby cordially tendered, to the local committee of the citizens of Pittsburgh, and especially to the worthy president and members of the Iron City Microscopical Society, for the warm reception given us and for the numerous attentions and favors received at their hands.

Resolved, That we offer many thanks to Carnegie Bros. & Co. for the opportunity of visiting their renowned steel works and the attention shown us there; to the Westinghouse Electric Co. for the exceptional and highly-prized privilege of inspecting their large and important works; to the Allegheny Observatory and Professor Very, who kindly guided our observations through the former; to John A. Brashear for a most interesting visit to his optical works; to the Engineers' Society of Western Pennsylvania for the generous tender of the use of their rooms; to the Chamber of Commerce for documents which will prove interesting souvenirs of our visit, and to the local Press for the interest shown in our work and for their careful reports of our proceedings.

Adjourned.

FRIDAY P. M., September 2, 1887.

President Rogers called the Society to order at 2 P. M.

The question of place of meeting next year was called up and after the views of members had been freely expressed, on motion the determination of time and place was left wholly to the Executive Committee elect.

Papers and Reports were read as follows:

Comparison of Fasoldt II, with Centimeter Scale "A."—Marshall D. Ewell.

Read by Prof. Rogers.

The Treasurer, Dr. Fell, presented his annual report, [see p. 326]. Referred to the Auditing Committee.

The same offered the following amendment to Article IX of the Constitution: "The entrance fee shall be two dollars and the annual dues shall be three dollars, paid in advance." The remainder of the Article to remain as at present. Referred to the Executive Committee.

The Erysipheæ of Illinois.—Thomas J. Burrill.

Notes on Microscopical Exhibitions.—R. H. Ward.

Read by title.

Permanent Potassium Hydrate Preparations.—Boardman L. Oviatt.

Read by Simon H. Gage.

Boardman L. Oviatt offered in substance the following on Permanent Potassium Hydrate Preparations :

While using the method of obtaining ultimate elements of tissue held together by cell-cement given in his paper on Cardiac Muscle Cells [see p. 283], he found it possible to permanently preserve the mounts. The tissues having been macerated a sufficient length of time in the potassium hydrate solution are teased out on slide and the cover glass is put on. A saturated aqueous solution of potassium acetate is now run under to excess and allowed to stand half an hour. The liquid is then drawn away with filter paper, the specimen retained in place and glycerine run in, after which it only remains to seal in the ordinary way.

A similar method was published by Professor Gage in *The Microscope* in 1886 [p. 267].

Dr. Fell reported for the Committee on Standard Micrometer.

The report called out remarks by the President, in the course of which he agreed to make twelve copies for the Society free of charge, unless ruled on glass with parallel faces, in this case the glass should be paid for.

The Secretary reported the state of the slide collection.

The Committee appointed at Rochester on the Standard Micrometer Screw asked to be discharged from further consideration of the matter. Agreed to.

The amendment to the Constitution proposed at the Chautauqua meeting was reported on adversely by the Executive Committee. Report adopted by vote of the Society.

President Rogers said the business of the meeting having been completed, the time had arrived for final adjournment. He desired to thank the Society for the courtesy and cordial support he had received. He asked Prof. Burrill and Dr. Fell to conduct the President-elect to the Chair which he would resign.

D. S. Kellicott, on taking the chair, thanked the Society for the confidence expressed by election to the high office of President of this Society; it is an organization he believed in and believed it had a field and a future. He would endeavor to serve the Society in the new relation with the same faithfulness that he had served it for six years past as Secretary, *i. e.*, to the best of his ability and opportunity.

By resolution the formal thanks of the Society was tendered to the retiring officers.

On motion of Prof. Rogers the meeting adjourned without day.

D. S. KELLICOTT,
Secretary.
S. M. MOSGROVE,
Asst. Secretary.